

WHAT IS CLAIMED IS:

1. A piezoelectric structure comprising:

a vibrational plate;

a piezoelectric film;

5           said vibrational plate including a layer of a  
monocrystal material, a polycrystal material, a  
monocrystal material doped with an element which is  
different from an element constituting the monocrystal  
material, or a polycrystal material doped with an  
10          element which is different from an element  
constituting the polycrystal materials, and oxide  
layers sandwiching the aforementioned layer,  
            said piezoelectric film has a single  
orientation crystal or monocrystal structure.

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2. A piezoelectric structure according to Claim  
1, wherein a film thickness  $D1$  of said vibrational  
plate and film thicknesses  $d1$ ,  $d2$  of said oxide layers  
satisfy  $d1+d2 \leq D1$ .

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3. A piezoelectric structure according to Claim  
2, wherein a film thickness  $D2$  of said piezoelectric  
film satisfy  $d1+d2+D1 \leq 5 \times D2$ .

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4. A piezoelectric structure according to Claim  
1, wherein a composition of said piezoelectric film is

either one of PZT, PMN, PNN, PSN, PMN-PT, PNN-PT, PSN-PT, PZN-PT, and has a single layer structure or a laminated structure of different compositions.

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5. A piezoelectric structure according to Claim 1, wherein said oxide layer comprises at least one of  $\text{SiO}_2$ , YSZ,  $\text{Al}_2\text{O}_3$ ,  $\text{LaAlO}_3$ ,  $\text{Ir}_2\text{O}_3$ , MgO, SRO, STO.

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6. A manufacturing method for manufacturing a piezoelectric structure having a vibrational plate and a piezoelectric film, said method comprising:

15 a step of forming a second oxide layer on a silicon substrate having a monocrystal silicon layer on a silicon layer with an oxide layer interposed therebetween;

a step of forming a piezoelectric film of a single orientation crystal or monocrystal structure on the second oxide layer; and

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a step of an upper electrode on the piezoelectric film.

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7. A liquid ejecting head comprising:

a liquid ejection outlet;

a main assembly substrate portion having a pressure chamber in fluid communication with said liquid ejection outlet and having an opening;

a piezoelectric structure connected so as to  
plug the opening;

said piezoelectric structure including,

a vibrational plate;

a piezoelectric film;

said vibrational plate including a layer of a  
monocrystal material, a polycrystal material, a  
monocrystal material doped with an element which is  
different from an element constituting the monocrystal  
material, or a polycrystal material doped with an  
element which is different from an element  
constituting the polycrystal materials, and oxide  
layers sandwiching the aforementioned layer,

said piezoelectric film has a single  
orientation crystal or monocrystal structure.

8. A liquid ejecting head according to Claim 7,  
wherein a film thickness D1 of said vibrational plate  
and film thicknesses d1, d2 of said oxide layers  
satisfy  $d1+d2 \leq D1$ .

9. A liquid ejecting head according to Claim 8,  
wherein a film thickness D2 of said piezoelectric film  
satisfy  $d1+d2+D1 \leq 5 \times D2$ .

10. A liquid ejection head according to Claim 6,  
wherein a composition of said piezoelectric film is  
either one of PZT, PMN, PNN, PSN, PMN-PT, PNN-PT, PSN-  
PT, PZN-PT, and has a single layer structure or a  
5 laminated structure of different compositions.

11. A liquid ejection head according to Claim 6,  
wherein said oxide layer comprises at least one of  
SiO<sub>2</sub>, YSZ, Al<sub>2</sub>O<sub>3</sub>, LaAlO<sub>3</sub>, Ir<sub>2</sub>O<sub>3</sub>, MgO, SRO, STO.  
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12. A manufacturing method for a liquid ejecting  
head including a liquid ejection outlet; a main body  
substrate portion having a pressure chamber in fluid  
15 communication with said liquid ejection outlet and  
having an opening; a piezoelectric structure connected  
so as to plug the opening, said manufacturing method  
comprising: a step of forming a second oxide layer on  
a silicon substrate having a monocrystal silicon layer  
20 on a silicon layer with an oxide layer interposed  
therebetween;

a step of forming a piezoelectric film of a  
single orientation crystal monocrystal structure on  
the second oxide layer;

25 a step of separating the piezoelectric film  
into a plurality of portions;

a step of an upper electrode on the

piezoelectric film; and

a step of forming said pressure chamber.

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